Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A mass flow controller, comprising:

a body portion having a first internal passage and a second internal passage formed therein;

a flow control valve coupled to the body portion and in communication with the first and second internal passages;

at least one pressure transducer coupled to the body portion and in communication with at least one of the first and second internal passages;

a nonlinear flow restrictor coupled to the second internal passage, wherein the non-linear flow restrictor comprises an elongated path length and is configured to produce a highly compressible laminar flow therethrough;

a thermal sensor in communication with at least one of the first internal passage, the second internal passage, and the nonlinear flow restrictor; and

an exhaust vessel in communication with the nonlinear flow restrictor.

2. (currently amended) The device of claim 1 wherein the second internal passage is configured to flow a fluid at a pressure greater than a pressure at an output of the nonlinear flow restrictor.

3. (currently amended) The device of claim 1 wherein the exhaust vessel is under vacuum.

4. [number skipped in original filing of patent application and in publication]

5. (currently amended) The device of claim 1 wherein the exhaust vessel is under near vacuum

6. (currently amended) The device of claim 1 wherein the exhaust vessel is ~~under pressure drop of~~ at about 0 psia to about 5 psia.

7. (currently amended) The device of claim 1 wherein the non-linear flow restrictor is manufactured from a compressed and sintered material.

8. (currently amended) The device of claim 1 wherein the non-linear flow restrictor is porous.

9. (currently amended) The device of claim 1 wherein the non-linear flow restrictor comprises a coiled capillary tube.

10. (currently amended) The device of claim 1 wherein the non-linear flow restrictor is positioned downstream of the flow control valve.

11. (currently amended) The device of claim 1 wherein the non-linear flow restrictor is configured to enable a pressure drop between a flow restrictor inlet and a flow restrictor outlet of a highly compressible laminar flow of at least 50 percent.

12. (currently amended) The device of claim 1 further comprising at least one pressure transducer in communication with an outlet of the non-linear flow restrictor.

13. (currently amended) A mass flow controller, comprising:

a flow control valve;

a pressure transducer positioned downstream of the flow control valve; ~~and~~

a nonlinear restrictor comprising an elongated path length with an inlet and an outlet, wherein the nonlinear restrictor is configured to produce a highly compressible laminar flow therethrough and wherein the nonlinear restrictor is ~~and~~ positioned downstream of the pressure transducer ~~sensor and configured to have an incremental pressure per unit of flow at the inlet at low flows~~; and

a thermal sensor in communication with the nonlinear flow restrictor.

14. (currently amended) The device of claim 13 wherein the nonlinear restrictor further comprises an internal diameter, and wherein the ratio of the elongated path to the internal

diameter is large.~~a laminar flow element configured to produce a highly compressible laminar flow therethrough~~.

15. (currently amended) The device of claim 13, wherein the nonlinear restrictor is configured to provide a pressure drop between the inlet and the outlet of at least about 50%.

16. (currently amended) The device of claim 13 wherein the nonlinear restrictor comprises a elongated capillary body having a small hydraulic diameter.

17. (currently amended) The device of claim 13 wherein the nonlinear restrictor comprises a sintered body.

18. (currently amended) The device of claim 13 wherein the nonlinear restrictor comprises a porous body having pores formed in parallel and series thereon.

19. (currently amended) The device of claim 13 wherein the nonlinear restrictor is formed in a variety of configurations selected from the group consisting of capillary tubes, annular gaps, annular plates, parallel plates, grooved plates, stacked plates, coiled capillary bodies, and coiled sheets.

20. (currently amended) The device of claim 14 wherein the nonlinear restrictor is configured to enable a pressure drop between the inlet and the outlet of highly compressible laminar flow of at least 50 percent.